CONNECTING COMPETENCE. SCHRACK TECHNIK

USER MANUAL

UNINTERRUPTIBLE POWER SUPPLY

Series GENIO Multi Switch ATS

USMSATS30 for 30A

3 phase input / 3 phase output

On Line / Double Conversion (VFI) Technology

INTRODUCTION

Thank you for choosing our product.

Riello UPS specialises in designing, developing and manufacturing uninterruptible power supplies (UPS) and accessories.

Multi Switch ATS (**MTA**) consist in a single-phase *automatic transfer switch* (ATS) high quality product which has been carefully designed and built in order to guarantee the highest levels of performance.

This manual contains detailed instructions for using and installing the product.
We recommend that this manual is referred to before attempting any operations on the ATS.

NOTE: Some images contained within this document are for indication purposes only, and therefore may not identically match the products in use.

In order to make it easier, in the next chapters, **Multi Switch ATS** (**MTA**) will be mentioned as “ATS”.

ENVIRONMENTAL PROTECTION

During the development of its products, Riello UPS dedicates extensive resources to managing environmental concerns.
All our products meet the objectives defined in the environmental management system developed by the company in compliance with standards in force.

No hazardous materials such as CFC, HCFC or asbestos are used in this product.

When evaluating packaging used, Riello UPS favours recyclable materials, which are listed in the table below.
Please dispose of these materials in compliance with your local standards.

DESCRIPTION	MATERIAL
Packaging corners	Polyethylene Foam
Box	Cardboard
Protective bag	HD Polyethylene

DISPOSING OF THE PRODUCT

The ATS contains internal components that (when disposed of) are considered Toxic or Hazardous Waste e.g electronic circuit boards. Please refer to qualified personal regarding the safe disposal of these items.

SECURITY

- The first connection to be carried out is the earth conductor. The device should not be operated without being connected to the earthing system.
- The device has two power input lines. Even if only one of the sources is active, the voltage level inside the system is dangerous.
- Do not perform any maintenance activities inside the ATS even if only one power source is connected to it.
- Always use a measuring device to check that no dangerous voltages are present inside.
- Do not insert any object in the ventilation slots or in any other openings.

ATTENTION! A soft damp cloth may be used to clean the outside of the machine (always with the system disconnected from the mains power supply and users).

Do not use any type of solvent as this may damage the external finishing of the machine.

ATTENTION! The ATS has been designed exclusively for professional use.

NOTE: These instructions may be modified by the wiring regulations in force in the country where the ATS is purchased.

Operation

The ATS has been designed exclusively to operate indoors. It is advisable to install it in areas where no inflammable liquids or gases, or other harmful or noxious substances, have been stored.

CONTENTS

OVERVIEW

RECEIVING THE MATERIAL

When the ATS is delivered confirm that the packing case has not been damaged during transportation.
Be careful when removing the packing case to avoid scratching the ATS cabinet.
The device must be handled carefully: any knocks or falls may damage it.

After opening the package, please check its contents. The ATS package contains the following material:

- No. 1 ATS module
- No. 1 user manual (this document)
- No. 2 fixing brakets with relatives screws for rack cabinet mounting
- No. 1 USB cable
- No. 1 output IEC-IEC 16A cable
- No. 1 warranty card
- No. 1 Download card

STORING

If this ATS module is to be stored prior to installation, it should remain in the original packing, in a dry place (storage temperature range: from -40°C to +70°C).

FUNCTION

The ATS source transfer switch is a simple and effective solution to manage the redundancy provided by two independent power sources, ensuring the uninterrupted operation of mission-critical equipment.

The ATS allows the automatic or manual transfer of your loads between two independent power sources without interrupting the supply of power. Either of the two sources may be designated as the preferred power source, with the other becoming the alternate source. In the event of a failure, the transfer from one source to the other is automatic and instantaneous.

Automatic transfer to the alternative source takes place if the voltage of the preferred source goes outside a tolerance above or below of the nominal value. Return to the preferred source is automatic when the voltage returns within the tolerance range.
To provide a maximum level of protection for the connected equipment, both power sources should be on-line type UPSs. However, the ATS module can also be supplied by one UPS and another type of source, or by two non-UPS sources providing a sinusoidal output (AC system, engine generator set, etc.).

CHARACTERISTICS

The ATS has the following characteristics:

- Input current up to 30A
- Input 30A thermal protections
- Output 16A thermal protections for OUTPUT 2 (16A output) and 10A thermal protection for OUTPUT 3 (10A output)
- 7 LEDs display
- Thresholds for to transfer from preferred to alternate source settable by user.
- RS232, USB communication ports and contacts port.
- Maximum operating temperature 40°C
- Dimensions: 1U x 19” x 330mm
- Weight: 5 Kg

ATS VIEWS

Figure 1 shows in detail the front and rear views of the ATS.

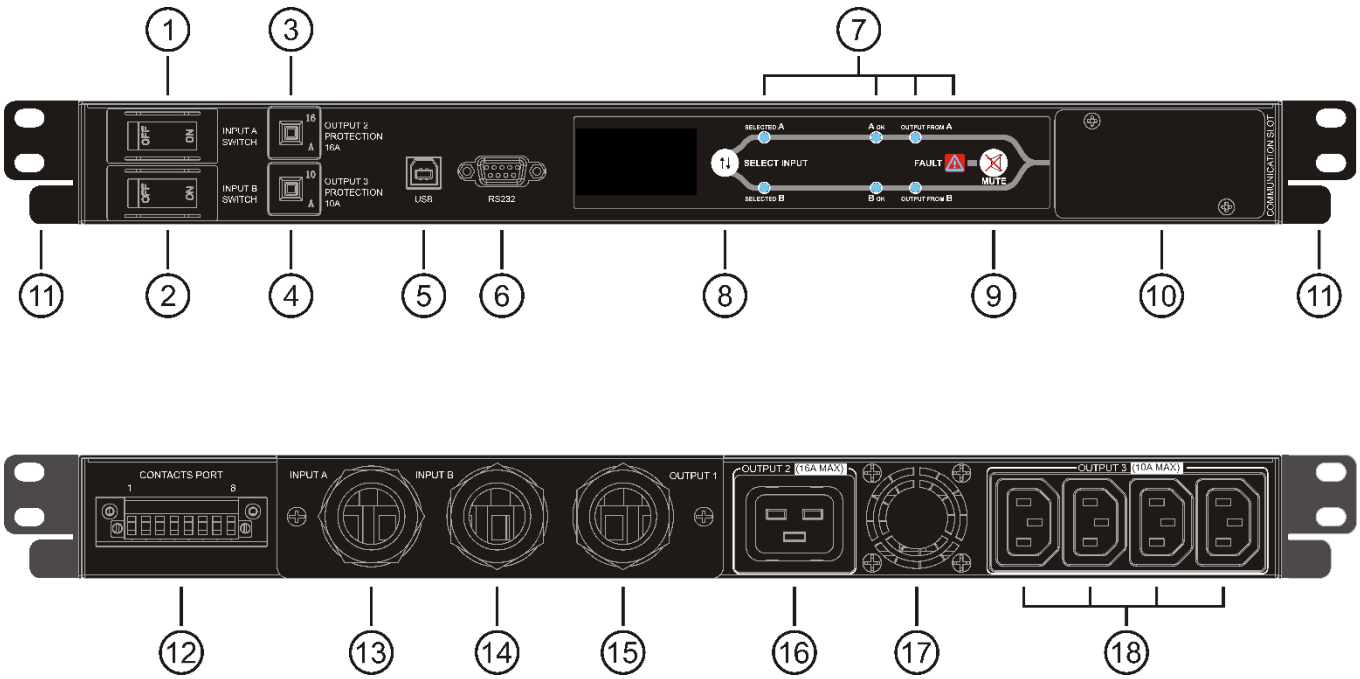


Fig. 1: front and rear views of ATS module.

FIGURE 1 LEGEND:

1. "INPUT A" switch
2. "INPUT B" switch
3. Output 16A thermal breaker "OUTPUT 2"
4. Output 10A thermal breaker "OUTPUT 3"
5. USB communication port
6. RS232 communication port
7. LED indication panel (see related paragraph)
8. Preferred source selection button
9. Acoustic signal mute button
10. Communication slot
11. Fixing brakets for rack cabinet mounting
12. Contacts port (see the relative paragraph for its functioning)
13. "INPUT A" input terminals
14. "INPUT B" input terminals
15. "OUTPUT 1" output terminals
16. Output IEC 16A socket "OUTPUT 2"
17. Cooling fan
18. Output IEC 10A sockets "OUTPUT 3"

CONTROL PANEL

The LED display on the front of the ATS shows the general functioning status of the ATS.

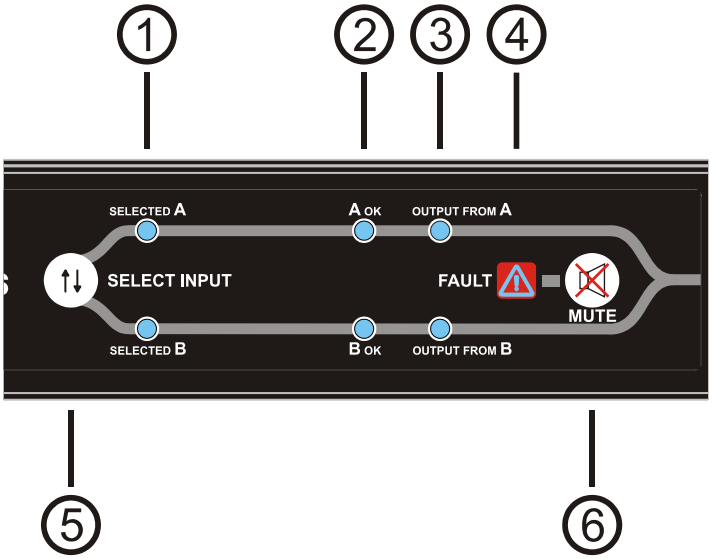


Fig. 2: Focus of LED display.

FIGURE 2 LEGEND:

1	Preferred input indication	SELECTED A	INPUT A is the preferred source
		SELECTED B	INPUT B is the preferred source
2	Input “OK” indication	A OK	INPUT A is OK
		B OK	INPUT B is OK
3	Output supplied indication	OUTPUT FROM A	Output supplied by INPUT A
		OUTPUT FROM B	Output supplied by INPUT B
4	Alarm indication	FAULT	On : an alarm has occurred
			Off : there is no alarm on the ATS
5	Preferred source selection button	SELECT INPUT	Change the preferred input selection by pressing this button [1]
6	Acoustic signal mute button	MUTE	Mute the acoustic alarm (buzzer) by pressing this button [2]

Notes:
[1] For further information, please refer to the “Configuring the ATS” chapter.
[2] If an acoustic alarm is present, it is possible to mute the buzzer by pressing the “MUTE” button on the display panel. The silence function of the buzzer is reset automatically when the alarm disappear, or it can be inactivated by pressing the MUTE button again.

INSTALLATION

Figure 3 shows how to install the ATS module in a 19-inch bay, using the four screws supplied to be screwed at the desired height in the cabinet uprights.

The air used to cool the ATS is drawn in through the grills located on the sides of the rack mounted ATS cabinet. The cooling air leaves the ATS cabinet through the grill located on the rear side of the cabinet.
When mounting the ATS in an 19'' enclosure, keep in mind that:

- Avoid dusty environments
- humidity at 20°C must not be greater than 90% non-condensing
- avoid placing the device in a position exposed to direct sunlight or hot air
- choose a rack cabinet with a suitable depth, in order to ensure a proper cooling of the equipment.
- In order to maintain the temperature of the operating environment as specified, it may be necessary to install an additional cooling system in the rack cabinet.
- Input and Output power connections are positioned on the rear of the ATS, protected by a backpack with glands (Input and OUTPUT 1).
  Choosing the rack cabinet, consider the space taken by the ATS, the backpack protection and the power connections to make the power connection easy.

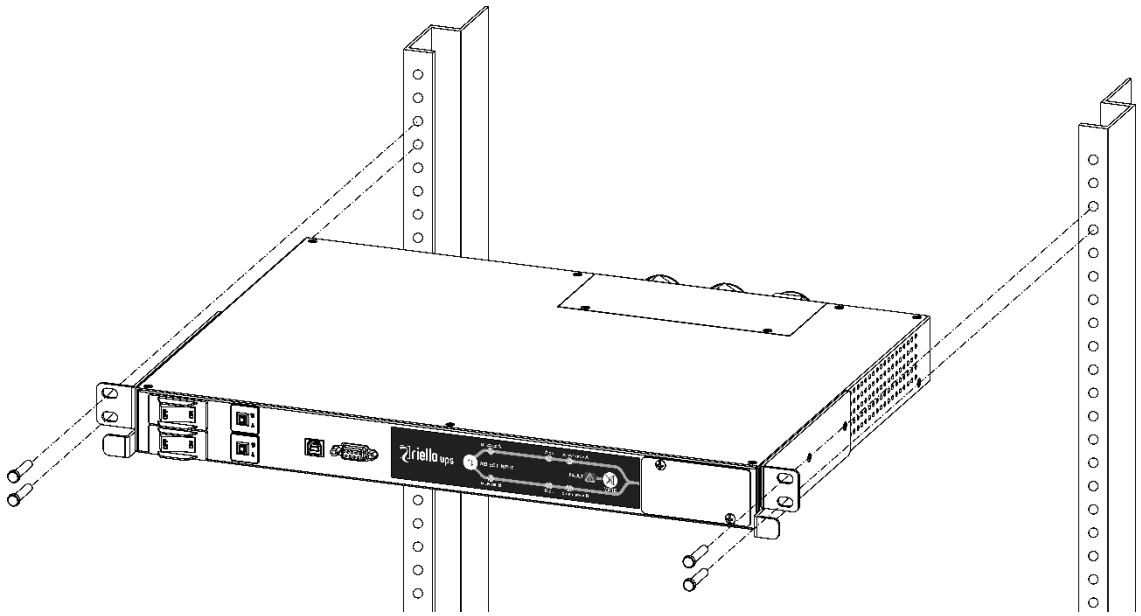


Fig. 3: ATS module in a rack cabinet mounting.

CONNECTIONS

INSTALLATION MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL.

THE FIRST CONNECTION TO PERFORM IS THAT OF THE PROTECTIVE CONDUCTOR (EARTH CABLE), WHICH MUST BE CONNECTED TO THE TERMINAL MARKED ⏚

THE ATS SHOULD NEVER BE OPERATE WITHOUT A CONNECTION TO THE EARTHING SYSTEM.

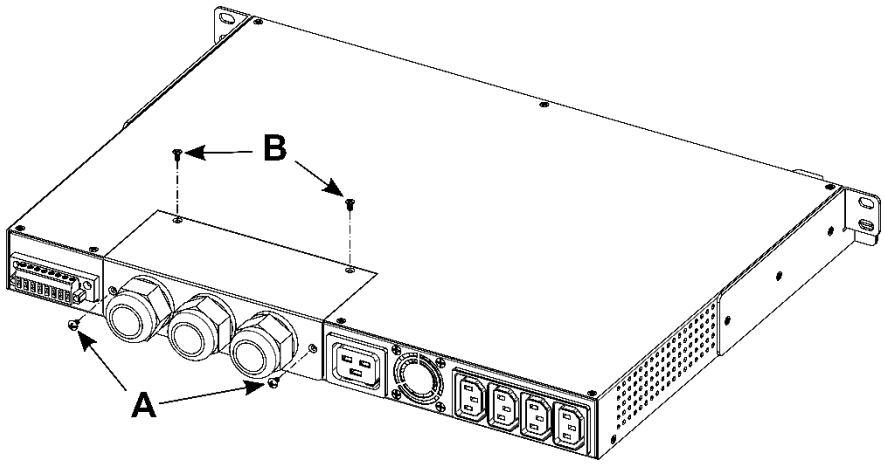
NOTE: if one of the two input sources is a UPS Line Interactive or a UPS set in ECO mode, connect this one to the INPUT A of ATS and the other source (mains or other) to the INPUT B.

Before making any connection, verify that:

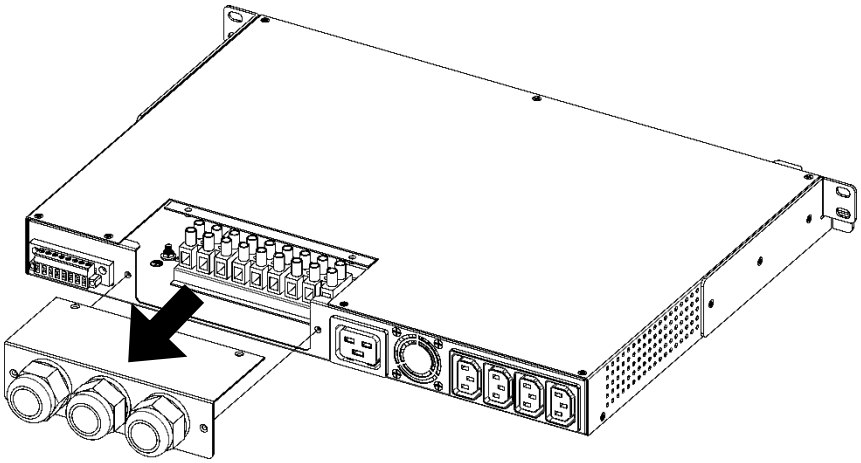
- the INPUT A and INPUT B switches are open
- No power applied to the source and output cables before completing all connections to the ATS unit.

To make the mains power and load connections, follow the instructions below:

1. The connection terminals to use for the input and output lines (OUTPUT 1 only) are located in the terminals cover. Unscrew the 2 serrated head screws (A) and the 2 countersunk screws (B) used to secure the cover (see next picture).



2. Pull the cover off (see following figure).



3. Insert the INPUT A and INPUT B cables, and if needed also the OUTPUT 1 cable in their respective three glands secured to the terminals cover.

5. Then connect the wires to the relative terminals, following exactly the instructions given below:

Input line A (INPUT A)

a - Make sure that no power is applied to the source cables of the ATS unit.

b - Connect the earth wire to the terminal ⏚.

c - Connect the neutral wire to the terminal “N”.

d - Connect the live wire to the terminal “L”.

Input line B (INPUT B)

a - Make sure that no power is applied to the source cables of the ATS unit.

b - Connect the earth wire to the terminal ⏚.

c - Connect the neutral wire to the terminal “N”.

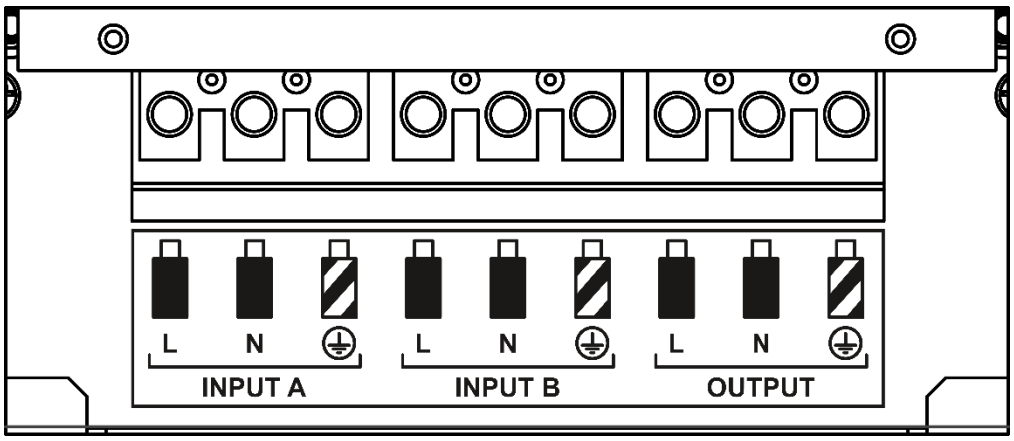
d - Connect the live wire to the terminal “L”.

Output line (OUTPUT 1)

a - Connect the earth wire to the terminal ⏚.

b - Connect the neutral wire to the terminal “N”.

c - Connect the live wire to the terminal “L”.



The cross section of the ATS input and output cables are specified in the table below:

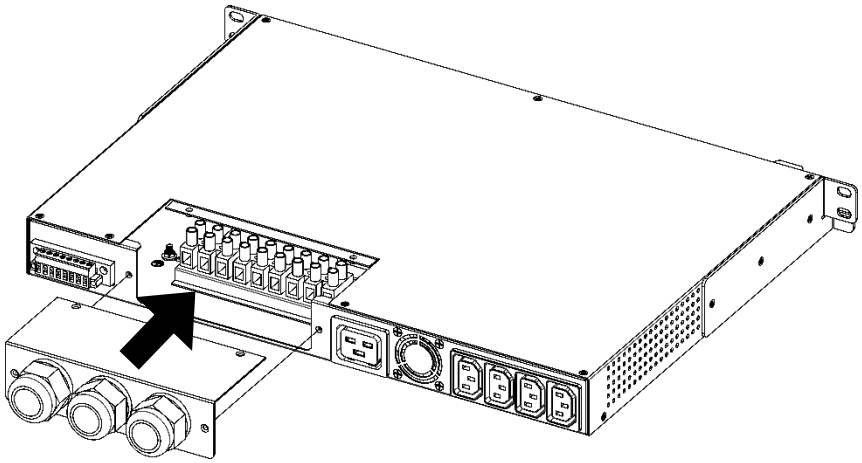
Nominal cable section (mm^2)			Max Connecting Capacity (mm^2)		
INPUT A / B - OUTPUT			INPUT A / B - OUTPUT		
⏚	L	N	⏚	L	N
6	6	6	10	10	10

Note: the Max Connecting Capacity sections are only for flexible cables without end sleeve termination.

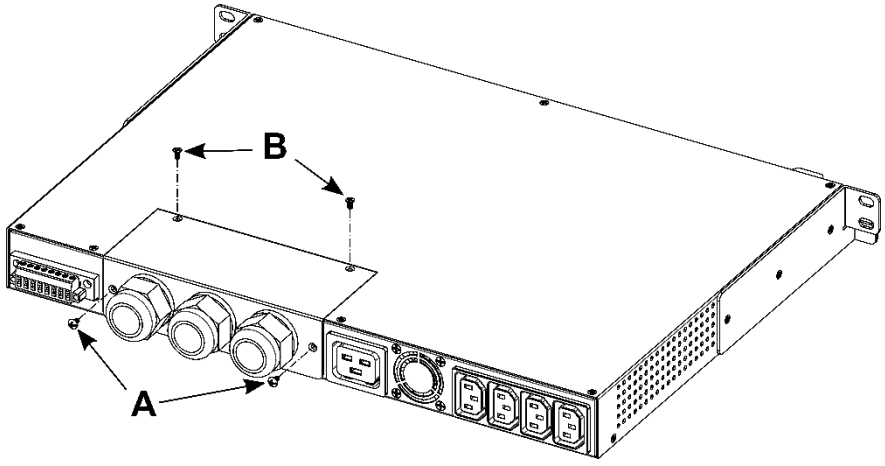
A WARNING LABEL (AS THE ONE SUPPLIED IN THE ACCESSORIES) MUST BE AFFIXED TO ALL MAINS POWER ISOLATING SWITCHES INSTALLED FAR FROM THE ATS AREA, IN ORDER TO REMIND SUPPORT SERVICE PERSONNEL THAT THE CIRCUIT IS CONNECTED TO AN ATS WITH SEVERAL INPUT SOURCES CONNECTED. THE LABEL MUST CARRY THE FOLLOWING MESSAGE:

COMPLETELY ISOLATE THE ATS SYSTEM
BEFORE WORKING ON THIS CIRCUIT

6. Replace the terminals cover in its position as indicated in the picture below.



7. Secure the terminals cover in position using the serrated head screws (A) and the countersunk screws (B) removed before.
   IMPORTANT: secure the screws in their original positions, do not invert the serrated head screws with the countersunk ones.



8. If needed, it is possible to connect the load to the 16A output socket (“OUTPUT 2”) or to the 10A output sockets (“OUTPUT 3”) at the same time or as an alternative to the “OUTPUT 1”.

CONFIGURING THE ATS

It is possibile to set the input preferred to supply the output by pushing the button “select input”.
The following table shows the configurations available.

FUNCTION	DESCRIPTION	DEFAULT	POSSIBLE CONFIGURATIONS
Preferred input(1)	Selection of input that normally supplies the load	INPUT A	• INPUT A • INPUT B

(1) If an internal ATS failure occurs or both input sources are not good at the same time, the ATS output will be connected automatically to the INPUT A independently of the preferred input selection.

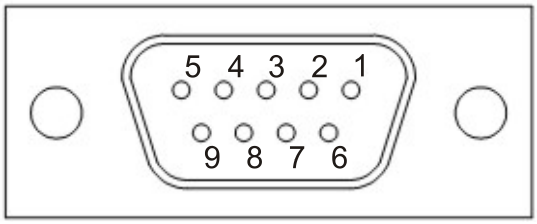
COMMUNICATION PORTS

The ATS is supplied with the following communication ports:

- Serial port is available with RS232 connector and USB connector on the front panel.
  NOTE: the use of one port automatically excludes the other.
- Expansion slots for additional COMMUNICATION SLOT interface boards
- Contacts port on the rear panel.

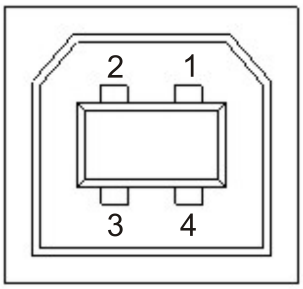
RS232 AND USB CONNECTORS

RS232 CONNECTOR



PIN #	NAME	TYPE	SIGNAL
1			
2	TX	OUT	Serial line TX
3	RX	IN	Serial line RX
4			
5	GND	POWER	
6	+12V	POWER	
7			
8			
9			

USB CONNECTOR



PIN #	SIGNAL
1	VBUS
2	D-
3	D+
4	GND

NOTE: the utilization of the communication port is optional and it is not necessary for the correct functioning of the ATS.
The RS232 and USB communication ports allows remote monitoring of the ATS via software; available for free download at www.riello-ups.com.

At the rear of the ATS a contact port is available that allows remote monitoring via internal relays (see related paragraph).

COMMUNICATION SLOT

The ATS is equipped with an expansion slot for accessory communication boards, enabling the equipment to communicate using the main communication standards.
Some examples:

- Ethernet agent with TCP/IP, HTTP and SNMP protocol
- JBUS / MODBUS protocol converter
- Second RS232 port
- Serial duplicator

To insert the board, unscrew the slot cover and carefully insert the board into the slot.
For further information on the accessories available, visit the web site.

CONTACTS PORT

The contacts port is formed using eight (8) pins numbered from left to right (see fig. 4), which can be connected to an external monitoring system (such as a BMS) in order to monitor the operational status of the ATS.
The external equipment must respects the voltage and current characteristics of contacts port.

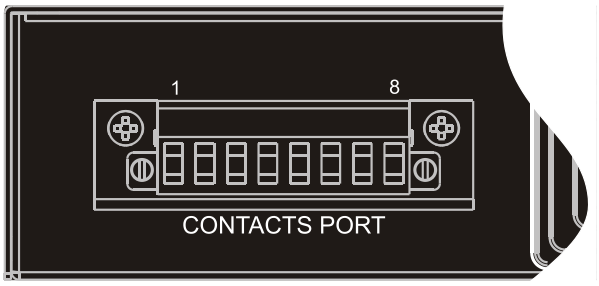


Fig. 4: Focus on contacts port.

The contacts port provides the following pins:

- Pin 1: supplies +12V d.c. and a maximum 100mA current usable as user needs.
- Pin 2: GND.
- Pin 3: common contact.
- Pin 4: “INPUT B” active contact (if the contact between “pin 4” and “pin 3” is closed, output is supplied by “INPUT B”).
- Pin 5: “INPUT A” active contact (if the contact between “pin 5” and “pin 3” is closed, output is supplied by “INPUT A”).
- Pin 6: “INPUT A” OK contact (if the contact between “pin 6” and “pin 3” is closed, “INPUT A” is present and regular).
- Pin 7: “INPUT B” OK contact (if the contact between “pin 7” and “pin 3” is closed, “INPUT B” is present and regular).
- Pin 8: Status OK contact (if the contact between “pin 8” and “pin 3” is closed, ATS functioning status is regular).

The following diagram shows the fuctioning of the contacts port.

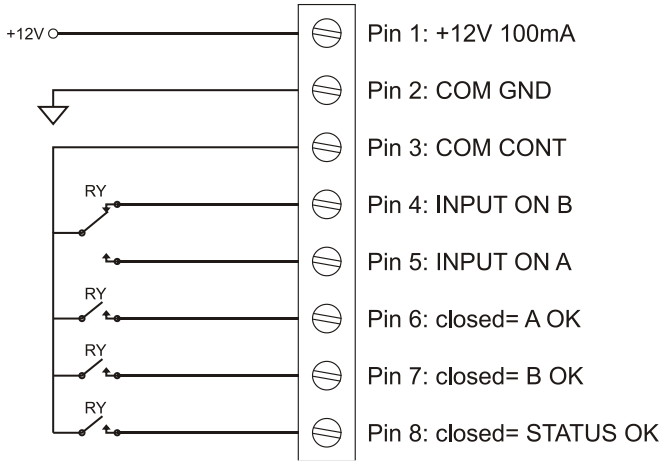
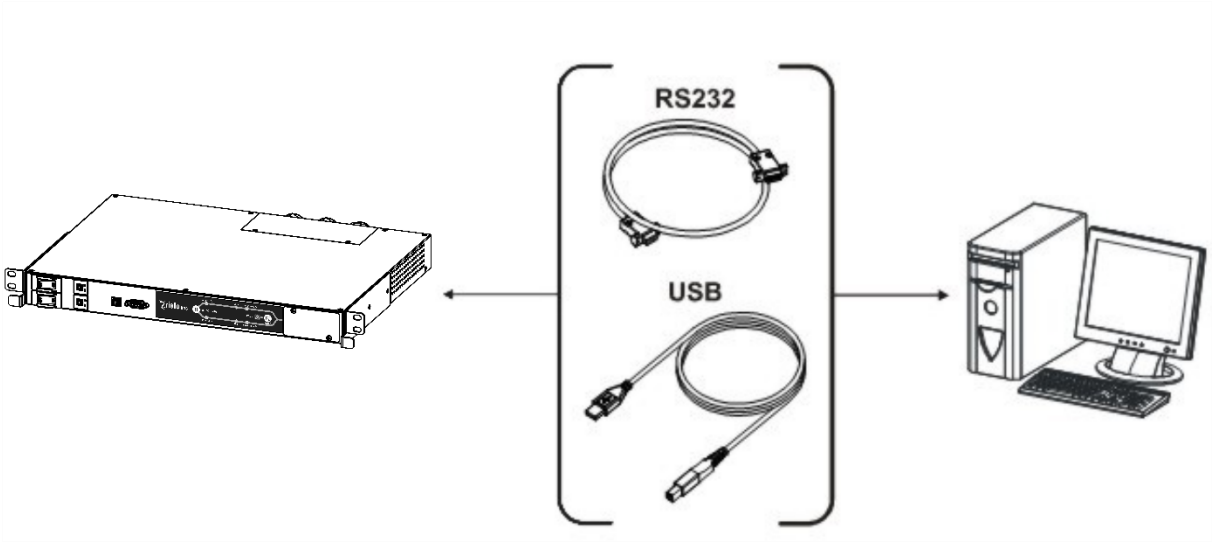


Fig. 5: Contacts port basic diagram.

<u>ATTENTION</u>: the pins of the contact port are able to carry a 1A maximum current and 48V maximum voltage.

SOFTWARE



MONITORING SOFTWARE

PowerShield³ software ensures an effective and user-friendly monitoring of the ATS, displaying important items of information such as the input voltage, load applied and phase displacement angle between inputs.
It can also automatically send e-mails, sms and network messages when specific user-selected events occur.

Installation operations:

- Connect the RS232 communication port of the ATS to a COM communication port of a PC via RS232 pin-to-pin cable**,** or connect the USB port of the ATS to a USB port of the PC using the USB cable provided.
- Download the software from **www.riello-ups.com**, selecting the desired operating system.
- Follow the installation program instructions.
- For more detailed information about **PowerShield³**, refer to the software manual which can be downloaded from our website **www.riello-ups.com**.

CONFIGURATION SOFTWARE

The **ATSTools** software allows the configuration of the ATS via USB or RS232.
For a list of possible configurations available to the user, refer to the software manual.

INSTALLATION OPERATIONS

- Connect one of the ATS's communication ports to one of the PC's communication ports using the cable supplied.
- Follow the installation instructions given in the software manual which can be found in our web site **www.riello-ups.com -> support**.

CAUTION:
If the RS232 communication port is used, it is not possible to communicate with the USB port and vice versa.
It is advisable to use a cable which is shorter than 3 metres for communication with the ATS.
To obtain additional communication ports with different functions, independent from the standard USB and RS232 ports on the ATS, various accessories are available which can be inserted into the communication card slot.

To check the availability of new, more updated software versions and for more information about the accessories available, consult the website.

DISPLAY INDICATION

The LED display shows the general functioning status of the ATS. The table below lists and describes the signal displayed.

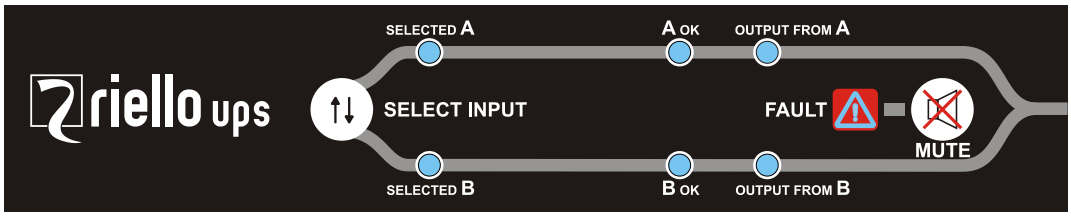


Fig. 6: Focus on LED display.

FIGURE 6 LEGEND:

Indication type	LED description	LED status	Condition	Sound
Preference indication	**SELECTED A**	ON	Power A is preferred	OFF
	SELECTED B	OFF		
	SELECTED A	OFF	Power B is preferred	OFF
	SELECTED B	ON		
Input power status	**A OK**	OFF	Inlet A has no power input	Intermittent acoustic signal (every 2s)
		ON	Inlet A has power input, and power is OK	OFF
		BLINKING	Inlet A has power input, but power is out of SPEC	Intermittent acoustic signal (every 5s)
	B OK	OFF	Inlet B has no power input	Intermittent acoustic signal (every 2s)
		ON	Inlet B has power, and power is OK	OFF
		BLINKING	Inlet B has power input, but power is out of SPEC	Intermittent acoustic signal (every 5s)
Output status	**OUTPUT FROM A**	ON	Output powered by INPUT A	OFF
	OUTPUT FROM B	OFF		
	OUTPUT FROM A	OFF	Output powered by INPUT B	OFF
	OUTPUT FROM B	ON		
	OUTPUT FROM A	OFF	No output	OFF
	OUTPUT FROM B	OFF		
Generic Alarm	**FAULT**	OFF	Alarm not present	OFF
		ON	Generic alarm present	Continuous
Overload	**FAULT**	OFF	Overload not present	OFF
		ON	Output overload	Intermittent acoustic signal (every 1s)

FIRST START-UP

Before the first start-up, verify that the INPUT A and INPUT B switches are in OFF position.

Proceed as indicated below:

1. Turn on the supply to INPUT A and confirm that the voltage is correct at terminal connections.
2. Turn on the supply to INPUT B and confirm that the voltage is correct at terminal connections.
3. Turn on the INPUT A and INPUT B switches (ON position). The ATS control circuits will be energized and the ATS will start operation.
   Note: the power is applied to the load connected to the output of the ATS at this stage.
4. Select your "PREFERRED" source. (Default factory setting is INPUT A). You can change your selection using the appropriate button on the control panel.
5. Check via the LED display, that the output is supplied by the INPUT A or INPUT B (LED "OUTPUT FROM A" or "OUTPUT FROM B" on).
6. Confirm that the "Fault" LED is off and there is no acoustic alarms.
7. The Automatic Transfer Switch is now operating normally.

FUNCTIONING CHECK

Only for the first start-up, when the ATS is operating normally, it is possible to simulate supply outages by opening the ATS input switches, or by opening the switches located upstream from the ATS.

During this process confirm that the load is switched from one source to the other smoothly and that no power interruption to the connected load occurs.

TURN OFF PROCEDURE

1. Switch off all of the loads which are connected to the Automatic Transfer Switch.
2. Switch off the input switches INPUT A and INPUT B
3. The ATS has now been completely isolated from all power sources and is therefore shut down.

TROUBLESHOOTING GUIDE

Irregular operation of the ATS is not always an indication of a fault, and can often be resolved quickly and simply. Please consult the table below, which may help you deal with some commons issues.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE ATS WITH THE MAINS VOLTAGE PRESENT, DOES NOT TURN ON (THE LEDs DOES NOT BLINK AND NO BEEP IS EMITTED)	NO CONNECTION WITH INPUT TERMINALS	Connect the mains to the input terminals as indicated in the installation paragraph
	INPUT SWITCHES IN “OFF” POSITION	Turn the input switches in “ON” position
	MAINS VOLTAGE NOT PRESENT (BLACKOUT)	Check that the mains voltage is present or check if the UPS supplying the ATS is powered on.
	PROTECTIVE DEVICE UPSTREAM ACTIVATED	Reset the protective device. Warning: check that there is no overload or short-circuit at the output of the UPS.
THE LOAD IS NOT POWERED	NO CONNECTION WITH OUTPUT TERMINALS OR OUTPUT SOCKETS	Connect the load to the output terminals or output sockets
	INTERVENTION OF 10A or 16A THERMAL PROTECTION	The hermal protection device will operate in the event of a short circuit or overload on one of the 10A or 16A output sockets. The thermal protection can be reset by pushing the button in, which will result in the power being reconnected to the load. Therefore, prior to attempting a reset of the thermal protection, please check the connected loads rating and/or determine if there are any problem. Then, once reset, reconnect each load one at a time to ensure no problems exists.
THE DISPLAY SHOWS NOTHING OR PROVIDES INCORRECT INFORMATION	THE DISPLAY HAS POWER SUPPLY PROBLEMS	Shut down the ATS completely and wait for a few seconds. Switch the ATS on again, if the problem persists, contact the nearest technical support centre.
THE DISPLAY IS OFF BUT THE LOAD IS POWERED	THE DISPLAY HAS POWER SUPPLY PROBLEMS	Contact the nearest technical support centre.

TECHNICAL DATA

Model	ATS
Nominal Voltage	220/230/240 Vac
Nominal Frequency	50 or 60Hz
Maximum Current	30A
Switching time	8-12ms typical, 16ms maximum
Display	7 LEDs display
Buzzer	Acoustic signal for overload, overtemperature, short-circuit or others internal faults.
Protections	Overload, overtemperature, short-circuit
Dimensions (W x D x H)	483 (19") x 330 x 44 (1U) mm
Weight	5 Kg
Ambient Temperature[(6)]	0 – 40 °C
umidity	0–95% non-condensing
Noise	< 25 dB

INPUT VOLTAGE AND FREQUENCY THRESHOLDS (DEFAULT SETTINGS)

FUNCTION	DESCRIPTION	DEFAULT SETTING
Low voltage INPUT A not good	Lower voltage value of INPUT A to switch on INPUT B	180V
Low voltage INPUT A good	Lower voltage value of INPUT A to return on INPUT A (with A setted as preferred and output supplied by INPUT B)	190V
High voltage INPUT A not good	Higher voltage value of INPUT A to switch on INPUT B	258V
High voltage INPUT A good	Higher voltage value of INPUT A to return on INPUT A (with A setted as preferred and output supplied by INPUT B)	248V
Low voltage INPUT B not good	Lower voltage value of INPUT B to switch on INPUT A	180V
Low voltage INPUT B good	Lower voltage value of INPUT B to return on INPUT B (with B setted as preferred and output supplied by INPUT A)	190V
High voltage INPUT B not good	Higher voltage value of INPUT B to switch on INPUT A	258V
High voltage INPUT B good	Higher voltage value of INPUT B to return on INPUT B (with B setted as preferred and output supplied by INPUT A)	248V
Low frequency INPUT A	Lower frequency value for INPUT A to switch on INPUT B	45Hz
High frequency INPUT A	Higher frequency value for INPUT A to switch on INPUT B	55Hz
Low frequency INPUT B	Lower frequency value for INPUT B to switch on INPUT A	45Hz
High frequency INPUT B	Higher frequency value for INPUT B to switch on INPUT A	55Hz

THE COMPANY

HEADQUARTERS

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